

# Evaluation of the Integration of Computer/ICT Education by Teachers in Junior Secondary Schools in Nigeria: A Case Study of Abia State

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## Abstract

This evaluative study investigated the level of the integration of computer/ICT education curriculum in the junior secondary schools in the three educational zones in Abia State. Research questions were formulated based on the comprehensiveness and adequacy of the curriculum, availability of computer/ICT facilities with required facilities; qualified and proficient teachers for effective teaching and learning. Four research questions were presented on the availability of basic computer laboratory and appropriate teaching/evaluation techniques for effective integration of computer education in the junior secondary schools in Abia State, Nigeria. Forty five out of one hundred and eight junior secondary schools that are offering computer/ICT education were randomly selected with simple random sampling technique. A total of sixty nine teachers were involved for the study. The data collected was analyzed with percentage and mean score. Findings of the result showed that computer education curriculum is adequate enough but the main objective of introducing this program in the junior secondary schools have not been fully achieved as a result of lack of computer/ICT laboratory, incompetent teachers that resulted to poor teaching and learning method. Government was advised to provide enabling environment like functional ICT facilities, qualified and proficient teachers who will be going for ICT training from time to time so as to updated with every ICT upgrade.

**Keywords:** teachers, computer/ICT facilities, curriculum, ICT integration.

## 1. Introduction

Universally education is regarded as the most powerful efficient tool that attracts professional development and economic empowerment. In this aspect, education can be regarded as a catalyst and prime mover for social, economic and individual changes. The integration of new innovative technology (computer/ICT) education to all levels hastens and enhances the educational development of any country. The federal government of Nigeria graciously joined other country to embrace the integration of computer/ICT in their educational system so as to remain economically and educationally viable in the 21st century technology boom. National US Higher Education ICT Initiative (2003) defined ICT as “the ability to use technology, communication tools, and/or networks appropriately to solve information problems in order to function in an information society. This includes the ability to use technology as a tool to research, organize, evaluate, and communicate information in the possession of a fundamental understanding of the ethical/legal issues surrounding the access and the use of information. Ogunneye (2000) established that it is not an exaggeration to state that a nation that makes its citizenry computer/ICT literate is a nation that wishes her people to be part of the global race for economic, political, industrial, and social emancipation, and also a nation that wishes to be among the producers of goods and services rather than a perpetual consumer of goods and services, and a nation that does not wish to be domed to obsolescence. The people of such a nation will be well developed intellectually and economically because they will possess large volumes of information, from other parts of the universe, to guide their effort in the development and decision making processes. It is not far from the truth that such people will function efficiently and effectively in the global culture that is marked by computer/ICT applications. The implementation of this laudable policy has its own fair share of problems like a coin that has two faces, but the advantages are tremendous.

Dawes (2001) retorted that new innovative technologies have the tendency to sustain education across the program of study thereby providing prospects for efficient communication among the students and the teachers in an organized way. Tremendous research studies have proven the advantages of computer/ICT to education. Education which is mainly for teaching and learning, have been integrated with ICT/computer so as to enhance its quality (Yusuf, 2005). Greater proportions of education in the developed countries have been immersed with ICT thereby enhancing teaching, learning and research. (Bransford, Brown & Cocking (2000) and Yelland (2001)) in Khalid (2009) reported that computer/ICT education was introduced in schools in early 1980s which made computer/ICT education to become an essential aspect of education. According to Yusuf (2005), the potentials of ICT will enrich, enhance, accelerate, motivate and engage scholars to create economic sustainability for tomorrow’s workforces including strengthening teaching with rapid change. The pursuit of computer education which has become prominent in the educational system is a ‘Sine-qua-non’ for any nation that desires to cope with the rapid, social, economic, scientific and technological changes of the third millennium. Ogunneye (2000)

concluded that the whirlwind of computer technological innovations and advances of millennium may envelop and cast into the sea of obsolesce any nation that does not embrace, with all vigor the teaching of computer/ICT education. Computer education is a culture which nations of the world now aspire to imbibe because it has been harnessed to productive ends in solving the problems that confronts man daily (Ogunneye, 2000).

Since computers/ICT are products of this technological age and the Nation's 6-3-3-4 system of education is geared towards science and technology, it is mandatory that all Nigerians become computer literate. In furtherance of this recognition, the Federal Government has made computer education or literacy compulsory for all levels of the nation's educational system. It is often expected by the policy makers or the curriculum legislature to see a direct correlation between the amounts of money spent in infrastructure (where there is any), computers and students scores on standardized achievement tests (Agbatogun, 2006).

The conscious attempts by the federal government and the society in developing computer /ICT education in Nigeria is appreciated. Yusuf (2005) to highlighted on the target objectives of the federal government of Nigeria on matters related to computer/ICT integration to all levels of education as follows:

- Development of viable ICT curricula primary, secondary and institutions of higher learning
- Making ICT compulsory at all stages/ of education
- Provision of fellowship, scholarships and grants for ICT courses
- Conducting ICT training for the Youth Service Corps associates
- Conducting ICT professional development and capacity building trainings in various state levels and zones.

### **Motivation and purpose of this study**

Though it has been many years since computer/ICT education was introduced in the nation's educational curriculum due to its relevance in education in this contemporary era, Ajayi (2002) pointed out that any country that neglected computer/ICT has already deleted her progress from the modern ere development no matter how wealthy such country is. Since the importance of ICT/computer in the educational system and economic development cannot be overemphasized and government of Nigeria have tried to integrate computer/ICT in the educational system but still the level of computer/ICT illiteracy is still on the high side. The slow pace of computer education development in Nigeria has become a source of concern. The researcher decided to investigate the comprehensiveness of the curriculum, extent of availability of ICT facilities (computer hardware) and manpower (computer teachers) used to implement computer/ICT education in the junior secondary schools in Abia State Nigeria because developmental progress is to a large extent tied to educational curricula. It is also necessary to find out if the Nigerian federal and state government who introduced ICT/computer in the educational system have been able to provide manpower and the required facilities. Or is it theoretically taught while expecting maximum outcome? There is need to evaluate the integration of computer education/ICT curriculum in the junior secondary schools using Abia State as a case study.

### **Purpose of the Study**

This study intended to examine the integration of computer/ICT education by teachers in the junior secondary schools in Abia State.

Specifically, this research sought to investigate:

- 1) if the junior secondary computer/ICT curriculum is appropriate for teaching and learning so as to achieve the intended objectives.
- 2) if there well established functional computer/ICT laboratories for effective teaching and by the teachers.
- 3) if there are trained, qualified and proficient teachers that will teach the students computer/ICT.

### **Research Questions**

The study sought answers to the following research questions:

- (1) Did teachers agree that junior secondary school computer/ICT education curriculum is comprehensive enough for the attainment of the required knowledge and skills?
- (2) Are there available well equipped ICT/computer laboratories for effective teaching of junior secondary school ICT/computer education curriculum?
- (3) Are the teachers proficient in utilizing ICT facilities for effective teaching of computer/ICT education?

## **2. Teachers' aspirations for computer/ICT education**

Khalid (2009) in his research stated that teachers have strong aspiration to integrate computer /ICT education into teaching but they are impeded by many barriers like lack of competency and confidence, inadequate funds, lack of access to resources like the hardware, software, peripherals, lack of professional development, insufficient technical support etcetera. Certainly if all the challenges are well taken care of, it increases the chances of admirable integration of computer/ICT education in any system. It is very important to bear in mind that the basic

agents of the technology transformation are the teachers. Teachers in general are models and modifiers starting from nursery level to tertiary level. Yalcin, Yalcin, Sagircin and Koc 2011 concluded that it is very important to apply the suitable pedagogy in the process of using technology in the classroom for pre-service teachers. Yalcin *et.al.* (2011) insisted that for teachers to learn with the aid of technology is not adequate enough; they must also learn how to effectively utilize technology in the classroom lessons. Robyler and Edward cited in Asiyai (2014) marshaled out five reasons why it is important for teachers to integrate computer/ICT in their teaching as motivation, unique instructional materials, essential skills for teacher's higher productivity and new technology teaching support. Bandhama (2012) suggested that there are software teaching packages for teaching various courses, multimedia set-ups, image enhancement, etcetera that can easily be integrated in teaching so as to make learning very easy and interesting. Computer/ICT integration during teaching and learning assist to reinforce the students' learning outcome with easy understanding of the topic (Cartwright & Hammond 2003; Herzog 2004; Lim & Chin 2004). In this regards, Onwuagboke, Singh & Fook (2015) recommended "Technological Pedagogical and Content Knowledge (TPACK)" model to be applied since inadequate technology facilities is affecting our teacher educational programmes. For instant, a teacher could be is utilizing ICT such as browsing the internet to make a research, find teaching materials and power point for his teaching; even though this teacher is applying ICT but he/she has not impact the students the skills on how to use this ICT by themselves.

Nagar and Bracha (2013) confirmed that the attention given to teachers towards ICT integration is not sufficient enough for effective changes to take place.

### **2.1 Low Computer/ICT Integration**

A recent research study by Asiyai (2014) concluded that the integration of ICT in teaching and learning of higher institutions in Delta State of Nigeria is low as a result of some factors like poor stake holders attitude towards ICT policy, poor funding of ICT facilities, inadequate knowledge and skills among students and teachers, insufficient technical staff and others. Eze & Aja (2014) reiterated in their study that the available ICT facilities in the secondary schools in Ebonyi Local Government Area are being under utilized as a result of lack of adequate trained personnel; while most of the computer ICT facilities are not in good condition for effective teaching and learning utilization. Badau and Sakiyo (2013) carried out an investigation on teachers' competence to implement ICT/computer education curriculum in the secondary schools reported low competency in the utilization of ICT/computer as a result of inadequate facilities, lack of trained teachers, insufficient power supply and government policy inconsistency. Badau and sakiyo (2013) concluded that ICT curriculum implementation goes beyond a focal point on subject skills which include 21st knowledge to handle information that are needed to build new skills and engage in long life learning.

Oshionebo and Ashang (2011) carried out a study on the ICT integration curriculum status of secondary school teachers and principals in Nigeria; it was reported that the integration of ICT is not encourage able and the traditional way of using chalk and board still takes upper hands in Nigerian secondary schools.

Efforts have been made to integrate ICT in the secondary schools by making sure that there is adequate provision of computer/ICT facilities and its utilization but still many schools do not offer ICT training programmes (Goshit, 2006). Lack of ICT facilities in schools hinder teachers from using ICT to teach (Okwudishu, 2005). Most previous studies reported that continual power failure in Nigeria has formed a loop hole in the integration and implementation of computer/ICT in the educational system (Okebukola 1998; Egunjobi,2003; Asiyai, 2010). Onojetah (2012) complained that poor ICT infrastructural facilities, insufficient funding, lack of manpower, poor internet connectivity and non provision of good computer/ICT laboratories brought about poor integration and implementation of ICT in the educational system in Nigeria.

The study carried out by Aduwa-Ogiegbaen and Iyamu (2005) concluded that inadequacy of fund, power supply, relevant text books and trained computer have been drawing ICT backwards. Without computer/ICT, economic and technological development in this 21<sup>st</sup> century will elude Nigeria (Aduwa-Ogiegbaen and Iyamu, 2005). To add to this, it has been suggested that new innovations also have drastic effect on teachers' attitude (Christensen, 2002). This is because some teachers have natural dislike to new technology and that is why they suffer technophobia (Akhaba, 2006). Aniebonam (2008) reported that lack of computer facilities and incompetent teachers have created a very wide gap in the effort to bridge digital divide in Nigerian academic empowerment It is understood that many secondary schools in Nigeria teach computer/ICT courses to their students starting from the junior class, still the level of computer illiteracy is still high among the teachers. Some primary schools in urban areas also have computer/ICT outfits in order to make the pupils computer literate. Rather the outcome of these efforts resulted to high computer/ICT illiteracy among the students rather because it is clear that one cannot give what he/she do not have. . The problems of computer/ICT implementation mainly have to do with finance, man power and infrastructure.

### 3. Methodology

#### 3.1 Design of the Study

The study is a survey research design that investigated the opinion of the respondents concerning the existing condition of computer/ICT integration teaching and learning in Junior Secondary School Computer Education Curriculum in Abia State, Nigeria. This type of study was chosen because the activities or event had already taken place.

#### 3.2 Area of the Study

The study was carried out in the three Educational Zones of Abia State which comprises of Aba in Abia South, Ohafia in Abia North and Umuahia in Abia Central Zonal Education Boards respectively.

**Table 3.1: ICT/computer teachers in each zone**

Education zone	No of selected schools	No of ICT/teachers
Aba	20	30
Ohafia	12	17
Umuahia	13	22
Total	45	69

#### 3.3 Population of the Study

The population of the study consists of all the computer/ICT teachers in one hundred and eight Junior Secondary Schools that are offering computer education/ICT in Abia State. This number of schools was obtained from Abia State Computer Examination Development Centre (CEDC) Umuahia.

#### 3.4 Sample and Sampling Techniques

A simple random sampling was used to select 45 junior secondary schools with their ICT/computer teachers out of the one hundred and eight schools. There are 69 ICT/computer teachers of JSS1-JSS3 in these selected schools that were involved in this research study. It was observed during selection of the schools that it was not all the junior secondary schools in these zones that offer computer/ICT education as result of lack of teachers and laboratory facilities. Because of this reason, all the computer/ICT teachers in the sampled schools were involved in the study so as to have enough respondents.

#### 3.5 Instrumentation

Structured questionnaire was the instrument for data collection and it contained 10-item questions which was administered to the computer/ICT education teachers for response.

Four-point Likert rating scale of strongly agree (SA), agree(A), disagree (D) and strongly disagree (SD) which represented 4,3,2,1, respectively was adopted.

#### 3.6 Validation of the Instrument

The questionnaire was face validated by three experts in measurement and evaluation department in the Faculty of Education, Abia State University uturu. All the corrections and suggestions given these experts were noted and effected. these corrections helped to print out the final and better copy of questionnaire.

Reliability of the instrument

10-item questionnaire was administered to ICT/computer teachers in five junior secondary schools in Okigwe Local Government Area in Imo State which were not part of the study population. The same test instrument was re-administered to the ICT/computer teachers of the schools after two weeks interval of administering the questionnaire. The data collected were correlated using Pearson Product Moment Correlation Coefficient statistics. And the reliability of the instrument was 0.81. Based on this value, the instrument for data collection was considered appropriate.

#### 3.7 Method of Analysis

Data collected was analyzed with frequency and percentage.

#### 4.1 Research Question1

Did teachers agree that junior secondary school computer/ICT education curriculum is comprehensive enough for the attainment of the required knowledge and skills?

Table 1: Teachers' response on curriculum comprehensiveness

Likert Scale	Frequency ( $\sum F$ )	Cum. Freq. ( $\sum FX$ )	%
SA	38	152	66
A	19	57	25
D	8	16	7
SD	4	4	2
Total	69	229	100

Strongly Agree (SA) = 4  
 Agree (A) = 3  
 Disagree (D) = 2  
 Strongly Disagree (SD)=1  
 Theoretical mean =2.5

$$\bar{x} = \frac{\sum fx}{\sum f}$$

Practical mean =229/69 = 3.32

From the result given, practical mean is greater than theoretical mean score. This shows that the junior secondary school curriculum is comprehensive enough for the attainment of the ICT required skill and knowledge.

#### 4.2 Research Question 2

Are there available well equipped computer laboratories for effective teaching of junior secondary school computer education?

Table 2: Teachers' response on equipped laboratories for teaching

Likert Scale	Frequency ( $\sum F$ )	Cum. Freq. ( $\sum FX$ )	%
SA	2	8	7
A	1	3	3
NA	31	62	57
SNA	35	35	32
Total	69	108	99

Strongly Available (SA) 4  
 Available (A) 3  
 Not Available (FA) 2  
 Strongly Not Available (SNA) 1  
 Theoretical mean =2.5

$$\bar{x} = \frac{\sum fx}{\sum f}$$

Practical mean =1.6

The result above showed that teachers response of 7% of strongly Agree (SA) as the highest value while 62% was the value for Not Available (NA). From the result, the practical mean is less than the theoretical mean which means that there is inadequate computer/ICT laboratories for teaching.

#### 4.3 Research Question3: Are the teachers proficient in utilizing ICT/computer facilities for effective teaching and learning of computer education?

Table 3: Teachers' response on the ICT/computer proficiency

Likert Scale	Frequency ( $\sum F$ )	Cum. Freq. ( $\sum FX$ )	%
SP	3	12	10
P	2	6	5
NP	33	66	57
SNP	31	31	27
Total	69	115	99

Strongly Proficient (SP)  
 Proficient (P)  
 Not Proficient (NP)  
 Strongly Not Proficient (SNP)  
 Theoretical mean =2.5



$$\bar{x} = \frac{\sum fx}{\sum f}$$

Practical mean = 1.6

The percentage of teachers that are strongly proficient in teaching computer/ICT education is 10%. The result shows that theoretical mean is greater than the practical mean. This means that there is inadequate proficient computer/ICT education teachers in the junior secondary schools in Abia State.

#### Finding of the Results

- The computer/ICT education curriculum for the junior secondary schools is comprehensive enough.
- The junior secondary schools in Abia State do not have adequate computer/ICT education facilities.
- There is insufficient proficient teachers in the junior secondary schools in Abia State.

#### Discussions, Recommendation and Conclusion

##### Interpretation and Discussion of Results:

The research questions sought to find out the extent to which the integration of computer/ICT objectives have been achieved in the junior secondary schools in Abia State.

Results obtained from the respondents (teachers) showed that the curriculum for the integration of computer/ICT education programme in the junior secondary schools in Abia State is comprehensive with its objectives. Oshionebo and Ashang (2011) carried out a study on the ICT integration curriculum status of secondary school teachers and principals in Nigeria; it was reported that the integration of ICT is not encourage able and the traditional way of using chalk and board still takes upper hands in Nigerian secondary schools.

Bandhama (2012) suggested that there are software teaching packages for teaching various courses, multimedia set-ups, image enhancement, etcetera that can easily be integrated in teaching so as to make learning very easy and interesting. Computer/ICT integration during teaching and learning assist to reinforce the students' learning outcome with easy understanding of the topic (Cartwright & Hammond 2003; Herzog 2004; Lim & Chin 2004). In this regards, Onwuagboke, Singh & Fook (2015) recommended "Technological Pedagogical and Content Knowledge (TPACK)" model to be applied since inadequate technology facilities is affecting our teacher educational programmes.

The study also proved that there are few available computer/ICT facilities in some schools but they are not adequately utilized for teaching and learning purpose because of lack of technical-know-how. Lack of ICT facilities in schools hinder teachers from using ICT to teach (Okwudishu, 2005). Most previous studies reported that continual power failure in Nigeria has formed a loop hole in the integration and implementation of computer/ICT in the educational system (Okebukola 1998; Egunjobi, 2003; Asiyai, 2010). Onojetah (2012) complained that poor ICT infrastructural facilities, insufficient funding, lack of manpower, poor internet connectivity and non provision of good computer/ICT laboratories resulted to poor integration and implementation of ICT in the educational system in Nigeria.

The integration of computer/CT education which involves, provision of computer facilities, power supply, updated text books, trained and proficient teachers is inadequate in the schools. . Eze & Aja (2014) reiterated in their study that the available ICT facilities in the secondary schools in Ebonyi Local Government Area are being under utilized as a result of lack of adequate trained personnel; while most of the computer ICT facilities are not in good condition for effective teaching and learning utilization. The study carried out by Aduwa-Ogiegbaen and Iyamu (2005) concluded that inadequacy of fund, power supply, relevant text books and trained computer have been drawing ICT backwards. Without computer/ICT, economic and technological development in this 21<sup>st</sup> century will elude Nigeria (Aduwa-Ogiegbaen and Iyamu, 2005). To add to this, it has been suggested that new innovations also have drastic effect on teachers' attitude (Christensen, 2002). This is because some teachers have natural dislike to new technology and that is why they suffer technophobia (Akhaba, 2006). Aniebonam (2008) reported that lack of computer facilities and incompetent teachers have created a very wide gap in the effort to bridge digital divide in Nigerian academic empowerment.

This research also covers the inventory aspect of the facilities that are required for in implementing this computer/ICT programme in the junior secondary schools. The results of the inventory indicate that 43% of the textbooks were available in the schools that were selected for the study, 41% of the computer hardware were seen in 45 out of 48 junior schools under investigation. 31% of teachers needed were on ground though all of them are proficient to impact the knowledge to the students. Also the researcher observed that the power supply is 28% which is very poor. This result indicate that the percentage performance of the study indices were less than 50. This level of percentage will not allow for optimal performance of teaching and learning computer of computer education programme integration. It is observed that most of the computer education teachers do have requisite knowledge of computer and computer application detailed in the curriculum as a result of lack of intensive training.

The implication is that the training given to these students cannot adequately address the expected desire for sustainable development and or human capacity building.

### Recommendations

To reverse this situation, more determined effort should be made in:

- providing the required computer hardware and accessories in sufficiently good quantity and working condition
- more robust training and re-training programmes for computer teachers should be implemented
- the supervisory agency (Federal and State Ministry of Education) should be more proactive.

### Conclusion

Computer education/ICT is a type of technology education that ever continues to create a laudable impact in the society if tackled from nursery (cradle) to tertiary institution. It is a type technology education that accepts, process, store and retrieve data or information when needed to solve a particular problem educationally or scientifically or otherwise. With the integration of computer/ICT in Nigerian educational system as specified by the curriculum objectives, the students will be proficient in the use of computer skill by the time they finish secondary education. This can be proved in the various families where our children are capable of operating the technological gadgets. These children even effect some repairs on our electronic gadgets in our family when malfunctions more than the adults that own those gadgets.

Studies gathered from this research and various sources showed that there is existence of incompetency in the teaching and learning of computer in the junior secondary schools as a result of lack of facilities and computer education teachers. Ogunneye, (2000) concluded that the whirlwind of computer technological innovations and advances of millennium may envelop and cast into the sea of obsolesces any nation that does not embrace with all vigor the teaching of computer education. This major handicap has deprived Nigerian educational system from enjoying the value of using computer technology.

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